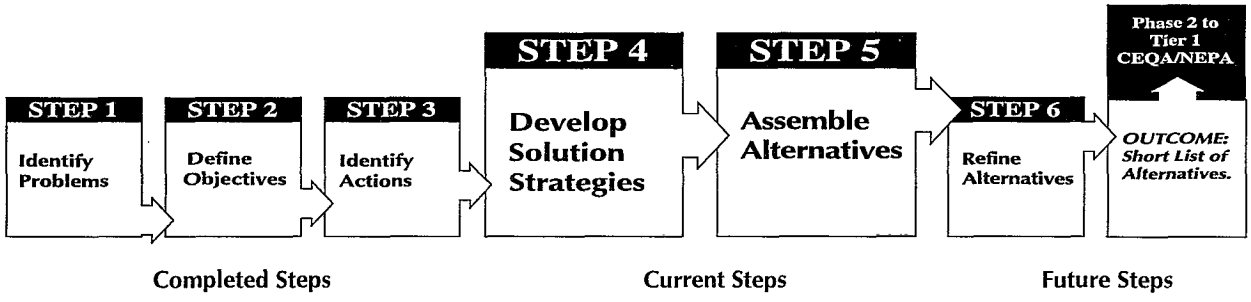
SUMMARY OF PROCESS FOR FORMULATING ALTERNATIVES

REVIEW OF THE SIX STEP PROCESS

The CALFED Bay-Delta Program will recommend a range of alternatives for solving problems in the Bay-Delta system. Phase 1 of the program will conclude in May of 1996 with recommendation of a short list of alternatives that will be the subject of detailed environmental review during Phase 2. The Program has identified six important steps to develop a short list of alternatives for evaluation in Phase 2. The following information describes the progress to date and the purpose of Workshop 4.



Identify Problems (Step 1)

The first step in developing a solution for the Bay-Delta was to define the problems in the Bay-Delta system. Workshop 1 produced a specific list of problems clustered in four main areas: Ecosystem Quality, Water Supply Reliability, Water Quality and System Vulnerability. This list was refined by the Program team and used for the next step in the process. **Appendix A** provides a summary of the primary Problems and Objectives.

Define Objectives (Step 2)

Once problems in the Bay-Delta were defined, the next step was to define the objectives for addressing the problems. Detailed statements of objectives were produced in Workshop 2, to guide the development and refinement of alternatives. Fourteen primary objectives were used in Workshop 3 to evaluate action categories.

Identify Actions (Step 3)

With problems and related objectives identified, the next step was to identify the action categories that could help meet the objectives. During Workshop 3 participants discussed 50 different action categories, which group similar actions. Workshop participants observed that

some categories were not specific enough to allow evaluation against objectives, so specific actions were subsequently identified within each category. **Appendix B** provides information on action categories and actions. **Appendix E** provides a summary of Workshop 3.

Develop Solution Strategies (Step 4)

The solution strategies set the stage for assembling preliminary alternatives. Solution strategies describe approaches and desired results that guide development of alternatives. The project team reviewed the problems, objectives and actions, as well as causes of problems and linkages among them. Using this information, they created a method of devising solution strategies based on primary conflicts in the Bay-Delta system, approaches to resolving the conflicts, and range of conflict resolution. This method provides a total of 32 starting points for assembling preliminary alternatives. More detail is provided below.

Assemble Alternatives (Step 5)

Focusing on one solution strategy, action categories that support the strategy are combined, forming a preliminary alternative. The Program team will assemble alternatives to be reviewed and refined during the remainder of the process. **Workshop 4 begins the process of assembling preliminary alternatives.**

Refine Alternatives (Step 6)

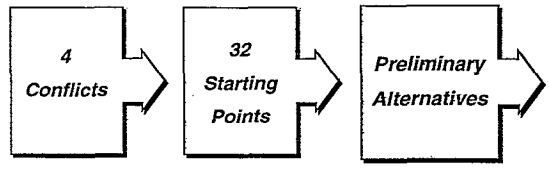
The final step in the process will develop a short list of alternatives for Phase 2 of the CALFED Program, preparation of an EIS/EIR. This step includes defining performance measures to evaluate the alternatives, conducting evaluations of the alternatives, and refining them based on the evaluations. The refinement process will result in the improvement and consolidation of alternatives, with the final result being a short list of alternatives that describe a range of solutions with the most promise for meeting the objectives.

BEGIN TO ASSEMBLE PRELIMINARY ALTERNATIVES

Workshop 4 begins the process of assembling preliminary alternatives.

Given the wide array of problems and objectives (Appendix A) identified by the Program, and the large number of potential actions (Appendix B) for addressing those problems and objectives, a procedure was needed to focus the development of preliminary alternatives.

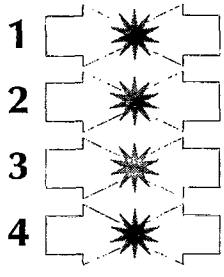
The Program team developed an alternative formulation process that focused on resolution of 4 primary conflicts among beneficial uses and resources in the Bay-Delta system. A total of 32 different strategies were developed to serve as the starting points for developing preliminary alternatives. The starting points are defined by three concepts: (1) primary conflicts; (2) approaches to resolve the conflict; and (3) level of conflict resolution. These are described in more detail in the following section and in **Appendix C**.



Define Starting Points

Identify Primary Conflicts

The Program team spent considerable time evaluating problems, objectives, causes of the problems, and linkages among them. An alternative formulation process which focuses on primary conflicts as a starting point provides a more focused approach than beginning alternative formulation by attempting to simultaneously resolve all problems in the Bay-Delta. Primary conflicts among beneficial uses in the Bay-Delta system are presented here as an initial focus to begin alternatives formulation. Most of the problems in the Bay-Delta are embodied in one or more of the primary conflicts summarized below. Like the problems they represent, these primary conflicts are not mutually exclusive but are also interrelated.



Fisheries and Diversions

Habitat and Land Use/Flood Protection

Water Supply Availability and Beneficial Uses

Water Quality and Land Use

The following paragraphs provide a brief summary of these conflicts. The primary conflicts and causes are described in more detail in **Appendix D**.

The conflict between **fisheries** and **diversions** results primarily from fish mortality attributable to water diversions. This includes direct loss at pumps, reduced survival when young fish are drawn out of river channels into the Delta, and reduced spawning success of adults when migratory cues are altered. The effects of diversions on species of special concern have resulted in regulations that restrict quantities and timing of diversions.

The needs for **habitat** and the needs for **land use** are often incompatible. Development of land, and the flood control facilities to protect the land, has resulted in an overall loss of habitat to support various life stages of aquatic and terrestrial biota. The need for habitat affects land development planning as well as levee maintenance and planning. Efforts to try to restore the balance often require that land used for agricultural production be dedicated to habitat.

As water use and competition among uses with respect to **water supply availability** have increased during the past several decades, conflicts have increased among **uses** of Delta water. A major part of this conflict is between the volume of instream water needs and out-of-stream water needs and the timing of those needs within the hydrologic cycle.

A conflict over **water quality** in the system results from the fact that **land uses** often do not contribute to good water quality, and ecosystem water quality needs are usually but not always compatible with urban and agricultural water quality needs.

Define Alternate Approaches to Resolving Conflicts

Many different approaches could be used in attempting to resolve each of the four primary conflicts between beneficial uses of the Bay-Delta system. To start the process, the Program will emphasize two significantly different approaches for each conflict. While these different approaches will help to define the bounds of potential ways to resolve the conflicts, some mix of these approaches will likely eventually be used and alternatives eventually selected for full evaluation will likely include actions from most or all of the following approaches.

Primary Conflict	Approach to Resolve Conflict
Fisheries and Diversions (Conflict 1)	Fish Productivity Approach (1A) Diversion Modification Approach (1B)
Habitat and Land Use/Flood Protection (Conflict 2)	Existing Land Use Pattern Approach (2A) Modified Land Use Pattern Approach (2B)
Water Supply Availability and Beneficial Uses (Conflict 3)	Demand Reduction Approach (3A) Supply Enhancement Approach (3B)
Water Quality and Land Use (Conflict 4)	Managing Quality of Delta Inflow Approach (4A) Post-Discharge Management Approach (4B)

The approaches to resolving the conflicts are discussed in more detail in **Appendix C**.

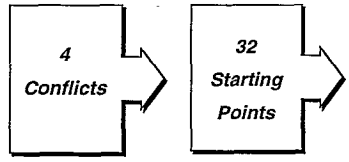
Define Range of Conflict Resolution

In addition to taking two different approaches to resolving each conflict, we can vary the level of conflict resolution to be achieved. For example, the least intensive strategy might seek to resolve the conflicts among beneficial uses of water to the point that endangered species concerns are not a limiting factor. A more intensive solution strategy might go well beyond endangered species to promote major increases in ecosystem functions while also increasing water supplies.

Starting Points for Assembling Preliminary Alternatives

These three concepts (primary conflicts, approaches for resolving the conflicts, and the range of conflict resolution) combine to create alternatives formation strategies. Each strategy can be used as a starting point to guide the selection of actions to create a preliminary alternative. Each of these starting point will include resolution of each of the four conflicts using one approach for each conflict. Thus, each starting point will incorporate the concept of equity among beneficial uses by resolving all of the four primary conflicts.

The **4 conflicts** generate **32 starting points** for assembling preliminary alternatives:



1) Identify **2 different approaches to resolve each of 4 conflicts**; [2 x 2 x 2 x 2 = 16]

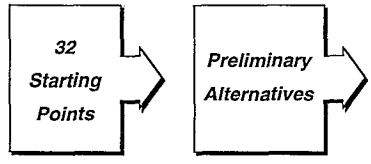
2) Identify **2 levels of conflict resolution** (least intensive and more intensive; say minimum and maximum for simplicity); [16 x 2 = 32]

3) Each starting point uses one approach for each of 4 conflicts and either a minimum or maximum conflict resolution

4) **All possible combinations yield 32 starting points** for assembling preliminary alternatives

These 32 starting points help to define the range of preliminary alternatives.

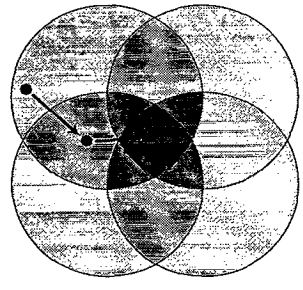
Assemble Preliminary Alternatives



Based upon the 32 starting points the Program team will generate preliminary alternatives. The preliminary alternatives bracket the possible outcomes of the CALFED Bay-Delta Program by reflecting a wide range of methods of resolving the primary conflicts. Because a starting point relies upon a single approach to resolve each conflict, the preliminary alternatives are not likely to be the most satisfactory alternatives to accomplish the objectives. The best alternatives are likely to include a mix of approaches to resolving the primary conflicts. However, evaluation of each preliminary alternative will provide insight to the team and the public about the best ways to combine approaches and improve alternatives.

The Program team will generate the preliminary alternatives by selecting actions and action categories from the results of Step 3 (and Workshop 3, Identify Actions). Each action and action category will be reviewed for its ability to resolve the primary conflicts and its approach to resolving them. The Program team will assemble at least one preliminary alternative for each of the starting points. These preliminary alternatives, and refinement of them, will be discussed at future workshops.

Refine Alternatives



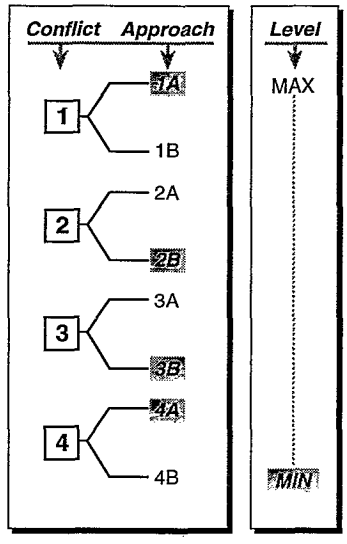
Each of the preliminary alternatives will be evaluated for its ability to accomplish the program objectives. Alternatives that are very similar may be consolidated, and new alternatives that combine approaches to resolve each conflict will be developed to reach a set of alternatives that represent the full range of feasible alternatives and stakeholder and agency interests and values. Additional refinement of alternatives will result in increased ability to accomplish multiple objectives efficiently and move toward the area of maximum overlap among interrelated problems.

This evaluation and improvement of alternatives can be repeated in an iterative fashion to further refine the alternatives.

Example Alternative Formulation Strategy
(One of 32 Starting Points)

Each starting point for resolving conflicts includes one resolution approach for each conflict (see above table) and either a minimum or maximum level of conflict resolution.

For this example, we have selected a starting point for assembling one preliminary alternative. One approach for conflict resolution was selected for conflict 1, one for conflict 2, and so on. The minimum, or basic level of conflict resolution was also selected. An initial set of actions (constituting a preliminary alternative) would be comprised of actions for resolving all four of the primary conflicts in combination. In our example, the set consists of actions selected from the following approaches and combining them into a preliminary alternative:



Fish Productivity Approach (1A)

Modified Land Use Pattern Approach (2B)

Supply Enhancement Approach (3B)

Discharge Reduction Approach (4A)

An initial solution package selected using this combination of the four approaches identified above must be evaluated, screened, and refined to become a true program alternative. In addition to conflict resolution, a comprehensive program alternative must meet the solution principles of being affordable, equitable, durable, and implementable. When viewed in its entirety, an alternative must not significantly redirect impacts within the Bay-Delta system or to other areas of California. To meet these solution principles, actions would be selected and added to the preliminary alternative from all solution approaches in constructing a truly viable program alternative.

WORKSHOP 4 ASSIGNMENT

At Workshop 4 the process for formulating alternatives will be discussed and used. Participants will have an opportunity to apply the process in small break-out groups, working from **primary conflicts** through **approaches to resolve conflict**, combining **actions** or **action categories** to develop an **alternative**.